COUNTING ROOM TECHNICIAN
JOB PERFORMANCE MEASURE

TASK CODE: CRT-E03

TASK: Calibrate the Liquid Scintillation Counter System

NAME: _____ **SSN**: _____

REFERENCES:

1. WP 12-RL1313, Packard LSC 2250 Operation/Efficiency Determination
2. WP 12-RL1320, Radioactive Source Control

TERMINAL OBJECTIVE:

Given a liquid scintillation counting system, calibrate the system per WP 12RL1313.

CONSEQUENCES OF INADEQUATE PERFORMANCE:

Improper sample analysis
Component damage

HAZARDS (PERSONNEL/EQUIPMENT STATUS):

None

PRE-REQUISITE TRAINING/ TASK COMPLETION:

1. CF 3.00 Series
2. CRT-E02, Perform Liquid Scintillation Counter Response Checks
3. CRT-E05, Perform Liquid Scintillation Counter Analysis

TOOLS/EQUIPMENT (MATERIALS REQUIRED):

1. Packard Liquid Scintillation Counting System
2. System Logbook
3. Radioactive Sources

Instructions to Trainee: You shall acquire the necessary references and equipment, and complete all required documentation. Knowledge requirements shall be completed with 80% or greater accuracy. Critical step performance shall be completed with 100% accuracy.

Instructions to JPM Evaluator: The trainee is to perform the terminal objective, without assistance, on the job site. Provide clarification of requirements if requested by the trainee. You are encouraged to ask relevant questions to verify trainee understanding. If the trainee fails this JPM, clearly document the reason for failure and forward to the trainee's manager. Successful completion of this JPM shall be recorded on the trainee's qualification card.

KNOWLEDGE REQUIREMENTS:

Reference	Knowledge Requirement	Pass/Fail
2	State the precautions associated with handling radioactive sources.	
1	Discuss the procedural precautions, limitations and prerequisites.	
1	State the required vials that must be positioned in the cassette to determine the efficiency.	
1	State when or how often an efficiency check is required.	
1	Describe an abnormality on the efficiency curve.	
1	State the purpose of determining alpha, and beta spillover.	
1	Describe the calculations required as part of the spillover determination.	
1	State the documentation that must be recorded in the system logbook.	
1	State who must review the documentation upon completion.	

PERFORMANCE REQUIREMENTS:

Reference	Performance Requirement	Pass/Fail
2	Obtain and check out the required radioactive sources/standards.#	
1	Verify all procedural precautions, limitations and prerequisites have been met.#	
1	**Efficiency Determination**	
1	Operate the computer and setup up for performing the efficiency determination#	
1	Position the required vials in the Varisette Cassette.#	
1	Count the standards.#	

1	Generate and review the efficiency curve for abnormalities.#	
Reference	Performance Requirement	Pass/Fail
1	Foward the report to the Laboratory Supervisor for review.#	
1	**Determination of Alpha and Beta Spillover**	
1	Verify the Alpha Mode Switch is in the ON position.#	
1	Set Alpha Discriminator Switch to 90.#	
1	Position the required alpha vials in the Varisette Cassette.#	
1	Count the samples, increase the Discriminator in increments of 10, continue counting until the desired range is covered.#	
1	Position the required beta vials in the Varisette Cassette.#	
1	Count the samples, increase the Discriminator in increments of 10, continue counting until the desired range is covered.#	
1	Determine the percent of alpha spillover into the beta channel for each discriminator setting using equation 1.#	
1	Determine the percent of beta spillover into the alpha channel for each discriminator setting using equation 2.#	
1	Plot the alpha spillover into the beta channel for each discriminator setting.#	
1	Plot the beta spillover into the alpha channel for each discriminator setting.#	
1	Record the discriminator setting where the percent spillover for both alpha and beta is at a minimum in the system logbook.#	
1	Set the discriminator to the determined setting.#	
2	Return and checkin the radioactive sources.#	

# indicates a critical step

FINAL EVALUATION: PASS FAIL

COMMENTS:

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EVALUATOR SIGNATURE: _____ **DATE**:_____

TRAINEE SIGNATURE: _____ **DATE**:_____

MANAGER SIGNATURE: _____ **DATE**:_____